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An apparatus for storing disk-shaped data storage media

The invention relates to an apparatus for storing disk-shaped data storage media, in particular of the CD or DVD kind.

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Such storage apparatuses are generally known and serve for the storage or transport of data storage media, for example in the form of compact disks, or their presentation for rental or sale.

TOP SECRET EDITION

- 10 US 5,593,031 describes an apparatus for the storage of optical memory disks having a movable disk holder which is movable relative to a housing which can be flipped open and which is arranged fully in the closed housing in the normal storage state.
- 15 It is the underlying problem (object) of the invention to provide a storage apparatus of the kind initially named which can be used in as versatile a manner as possible with simple handling.

This object is solved by the features of claim 1.

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- 25 The coupling member provided in accordance with the invention, which is also termed a clip in the following, allows the possibility of coupling a data storage medium arranged in the reception space of the flat housing to be coupled to carrier units of generally any design via the outer portion of the coupling member.

In accordance with the invention, a flat housing is provided that has a slot opening via which a reception space for the data storage medium is

accessible, wherein the coupling member can be inserted into the flat housing via the slot opening and is releasably connected, in particular latched, to the flat housing in the inserted state.

- 5 The data storage medium can be stored in a manner protected against outside influences in such a flat housing. The coupling member allows the possibility of not only coupling the flat housing to carrier units, but of simultaneously reducing the size or completely closing the slot opening of the flat housing. The clip thus performs two functions simultaneously by,
- 10 on the one hand, providing a simple fixing possibility for the flat housing and, on the other hand, providing better protection of the data storage medium against outside influences, for example against dust or moisture penetrating the reception space through the slot opening. Moreover, this embodiment of the invention allows a variety of possibilities to handle
- 15 both individual and multiple flat housings for data storage media simultaneously. For example, the handling of a plurality of flat housings each coupled to a clip and thus the simultaneous storage of a number of data storage media is made substantially simpler, since the flat housings can be collected in a clearly arranged and ordered manner at carrier units
- 20 and can be connected individually to the carrier unit via the respective coupling member. The flat housings can thus be replaced independently of one another without disturbing the overall arrangement.

In accordance with a preferred embodiment of the invention, the coupling member comprises an insertable portion which is provided with an approximately part circular-like cut-out and which, in the inserted state, fills up the space between the slot opening and the circular reception

space for the data storage medium in the flat housing at least in part, preferably substantially in full.

The space available in the flat housing is utilized by the coupling member  
5 in accordance with the invention in an ideal manner in this way. The data storage medium can be given additional security in the flat housing by the provision of the part circular-like cut-out in the insertable portion of the coupling member which can be matched to the contour of the respective data storage medium.

10 In accordance with a further preferred embodiment of the invention, at least one of the narrow sides of the flat housing adjacent to the slot opening is provided with projection-like latching means for the coupling member.

15 The possibility provided in this way of latching the coupling member to the flat housing results in a mechanical connection between the clip and the flat housing which can be made and cancelled in a particularly fast and simple manner.

20 If, in accordance with a further preferred embodiment of the invention, at least one connecting element which connects two halves of the flat housing to one another is formed as the latching means, the number of features to be formed at the flat housing is minimized by this double use  
25 of the connecting element and the manufacture of the flat housing is thus simplified.

In accordance with a further preferred embodiment of the invention, the outer portion of the coupling member arranged outside the flat housing when the coupling member is inserted has at least one coupling element via which the coupling member can be connected, in particular releasably connected, to carriers, in particular in the form of flip covers cases, outer packaging, rod arrangements, hanging registers, storage racks, display units, storage apparatuses, rail systems and/or plug systems.

A plurality of flat housings can in this way be attached in an ordered and clearly arranged manner to a carrier ideally formed for the respective purpose. The clip in accordance with the invention, which is simple and cost-favorable in manufacture, here serves in each case as an adapter piece for the flat housings which thus do not have to be subjected to any constructional change in order to be combined with the different carriers.

Furthermore, a plurality of carriers can be assembled in the manner of a modular system to carrier constructions of generally any design, for example for the storage, rental, sale and/or presentation of CDs or DVDs, with the coupling member in accordance with the invention respectively allowing an individual arrangement of the flat housing.

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In accordance with a further preferred embodiment of the invention, the coupling member is a component of a folding packaging, in particular one consisting of cardboard or card.

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A particularly simple possibility of shipping data storage media is provided in this way. The flat housing containing the data storage medium and the folding packaging are simply connected together to form a unit ready for shipping for this purpose.

Further preferred embodiments of the invention are given in the dependent claims, the description and the drawing.

- 5 The invention is described in the following by way of example with reference to the drawing, in which are shown:

Figs. 1 and 2 embodiments of a storage apparatus in accordance with  
10 the invention comprising a coupling member which can be coupled to rod arrangements;

Figs. 3 – 6 embodiments of a storage apparatus in accordance with the invention for connection to DVD boxes; and

15 Figs. 7 and 8 embodiments of a storage apparatus in accordance with the invention comprising a coupling member which can be coupled to a rail system.

The storage system in accordance with the invention shown in Fig. 1  
20 comprises a flat housing 10, in which a disk-shaped data storage medium 12, e.g. a CD or DVD, is received, and a coupling member 14 that is inserted into the flat housing 10 through a slot opening 16.

The flat housing 10 is a component of a storage apparatus for data storage  
25 media which is described for example in the German patent application 197 28 705 (application date: July 4, 1997) or in the international patent application WO 93/16471 (published on August 19, 1993). The flat plastic housing 10 consisting of a light-transmitting and in particular tinted

material has an ejection mechanism for the data storage medium 12 which comprises an actuating lever 18 and two pivoted levers 20. The data storage medium 12 is held in the flat housing 10 by the pivoted levers 20, whereas – with the coupling member 14 removed – it can be ejected

- 5 against the holding force of the pivoted levers 20 through the slot opening 16 by means of the actuating lever 18 which has an actuating section 19 projecting out of the flat housing 10.

The coupling member 14 comprises an insertable portion 22, which is

- 10 arranged in the flat housing 10 in the inserted state in accordance with Fig. 1, and an outer portion 24 which is located outside the flat housing 10 in the inserted state.

The insertable portion 22 is provided with a part circular-like cut-out 26

- 15 which is matched to the contour of the circular data storage medium 12. The space between the data storage medium 12 or a circular reception space for the data storage medium 12, the slot opening 16 and the narrow sides 28 of the flat housing 10 adjacent to the slot opening 16 is substantially fully filled up by latching regions 21 of the insertable portion 22. The thickness of the insertable portion 22 preferably corresponds approximately to the height of the space available in the flat housing 10.

Each latching region 21 of the insertable portion 22 has a cut-out 33 in the shape of an elongate slot which extends parallel to the respective

- 25 narrow side 28 in the inserted state. The cut-outs 33 are each bounded by a material web 32, which is provided with an engaging section 34, at the side facing the respective narrow side 28 in the inserted state.

In the inserted state, the insertable portion 22 of the coupling member 14 is in engagement with connecting elements 36 protruding inwardly from the narrow sides 28 such that the engaging sections 34 latchingly engage behind the connecting elements 36.

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Connecting elements 36 which are further removed from the slot opening 16 and are not intended to cooperate with the coupling member 14 can be seen in Fig. 1. The connecting elements 36 provide a releasable latching or inserting connection between two halves forming the flat housing 10 and  
10 are each molded onto one of the two halves of the flat housing 10 or formed in two parts with two single elements each molded onto one of the halves.

The connecting elements 36 cooperating with the coupling member 14  
15 thus serve as latching means of the flat housing 10 both for connection to the coupling member 14 and for holding together the two halves of the flat housing 10.

At least one of the halves of the flat housing 10 is provided at its edge  
20 bounding the slot opening 16 with two part circular-like indentations 38 in which, in the inserted state, fixing lugs 40 are seated which are arranged at the outer portion 24 of the coupling member 14 and shaped in complementary manner to the indentations 38 and which provide a defined relative position between the coupling member 14 and the flat  
25 housing 10.

Abutting shoulders 25 of the outer portion 24 determine the maximum insertion depth of the insertable portion 22 in the flat housing 10.

The outer portion 24 of the coupling member 14 can have a greater thickness than the insertable portion 22 and be provided with at least one abutment edge which, in the inserted state in accordance with Fig. 1,

- 5 abuts one of the edges of the flat housing 10 bounding the slot opening 16. The flat housing 10 can furthermore be provided with braking and guide rails which are opposite one another and which extend over the width of the slot opening adjacent to the slot opening 16, whereby they form a passage constricted with respect to the slot opening 16 for the data storage medium 12 and the insertable portion 22 at the inside of the flat housing 10. In this case, the insertable portion 22 can be provided with at 10 least one abutment edge contacting the braking and guide rails in the inserted state.
- 15 In the embodiment of Fig. 1, the outer portion 24 of the coupling member 14 is formed as a rectangular locating strip whose width is selected such that it ends flush with the outer surfaces of the narrow sides 28 of the flat housing 10. The outer portion 24 is provided at its side remote from the slot opening 16 with two circular apertures which each serve as a 20 coupling element 30 and whose spacing is selected in accordance with conventional, in particular standardized rod arrangements, such as, for example, of Leitz files or the like.

Fig. 2 shows how a plurality of the storage apparatuses in accordance 25 with the invention can be arranged in such a carrier 42 designed in the way of a book or file for the storage of a plurality of disk-shaped data storage media 12.

The coupling member 14 is made of a re-usable material, for example a recyclable plastic such as polypropylene or of a cardboard or card material. Furthermore, the coupling member 14 can be provided, in particular at its outer side 24, with a chip or another information medium carrier which, for example, information relating to the content of the respective data storage medium 12 can be stored. This chip or information carrier can be designed for remote reading so that the respective information can be transferred to an evaluation and/or display apparatus by being moved past a reading station.

10 The insertable portion 22 is inserted through the slot opening 16 with material webs 32 aligned parallel to the narrow sides 28 to make the latching connection between the coupling member 14 and the flat housing 10. The rounded free ends 23 of the latching regions 21 ensure a reliable 15 guidance of the insertable portion 22. The material webs 32 are elastically deformed during the insertion of the insertable portion 22 into the flat housing 10 by the connecting elements 36 representing the latching means of the flat housing 10 so that the engaging elements 34 can be moved past the connecting elements 36. When the pre-set insertion depth 20 has been reached, the engaging sections 34 spring back, whereby they latchingly engage grip behind the connecting elements 36 and the coupling member 14 is thus latched in the flat housing 10.

To release the latched connection, the material webs 32 are subjected to 25 loads, either from the outside via the narrow sides 28 of the flat housing 10 or by means of a special tool which can be brought into the flat housing 10 in addition to the inserted coupling member 14 – for example via apertures in the housing narrow sides 28 which are not shown in Fig.

1 – and are pressed into the cut-outs 33 while being elastically deformed in order to release the interlocking with the connecting elements 36 and to allow the coupling member 14 to be pulled out of the flat housing 10.

- 5 Figs. 3 to 6 show the storage apparatus in accordance with the invention in connection with carriers formed as DVD boxes 42 in which disk-shaped data storage media of the DVD type which have a larger diameter than conventional compact disks are stored. The boxes 42 can, however, generally also be used for other data storage media which are arranged in  
10 a flat housing 10 which can be connected to a coupling member 14. The DVD boxes 42 are preferably formed in one piece, with them being manufactured using the injection molding method and being made of a transparent material preferably of plastic and preferably of polypropylene.  
15 In the embodiment in accordance with Fig. 3, the coupling member 14 can be connected to the DVD box 42 such that it is biased into the position of Fig. 3. The flat housing 10 can in this way be set onto or removed from the coupling member 14 comfortably, as is indicated by the double arrow, when the cover 46 is pivoted open.

20 While, in accordance with Fig. 3, the coupling member 14 is formed in one piece with a narrow side 44 of the jewel-case like DVD box 42 and is in particular pivotably connected via a region of reduced material thickness formed as an integral hinge, the coupling member 14 in the embodiments  
25 in accordance with Figs. 4 to 6 can be releasably fixed in place in the respective DVD box by means of coupling elements 30 described in more detail in the following.

A DVD box 42 is shown in Fig. 4 which is made in one part and from transparent plastic and into which an information insert 48, for example a booklet or a brochure, can be inserted. The information insert 48 is pushed under fixing elements 50, 52 for fixing in place in the DVD box 42,  
5 with said fixing elements 50, 52 being spaced from the respective flat side 51a, 53a at narrow sides 44 of flat sides 51a, 53a of a reception half 51 or of a cover half 53 to form slot-like insertion cut-outs.

The fixing elements 50 arranged in each case in a corner region of the  
10 reception half 51 serve for the fixing in place of the coupling member 14 in the reception half 51, with the outer portion 24 of the coupling member 14 being provided with coupling elements 30 bent in a hook-like manner. In the state fixed in the DVD box 42, the coupling elements 30 grip around cylindrical projections 50a of the fixing elements 50 so that the coupling  
15 member 14 and a flat housing 10 (not shown) connected to the coupling member 14 can only be inserted into and removed from the DVD box 42 in a direction perpendicular to the flat side 51a.

An embodiment of the storage apparatus in accordance with the invention  
20 is shown in Fig. 5 whose coupling member 14 has two coupling elements 30 formed in the manner of gripping elements at its outer portion 24, said coupling elements 30 being able to be brought into engagement with web-like fixing elements 50 which are formed at the narrow side 44 of the DVD box, which extend parallel to the narrow side 44 and which are inwardly  
25 offset. The coupling member 14 or the flat housing 10 can also only be removed and inserted in a direction extending perpendicular to the flat side 51a of the DVD box 42 in this embodiment.

A further embodiment of a coupling member 14 of a storage apparatus in accordance with the invention is shown in Fig. 6 which can be fixed in place at a DVD box 42 provided with an information insert 48, which is inserted into insertion slots between the flat side 51a and coupling

5 elements 30 of the coupling member 14. For this purpose, the fixing elements 50 are provided which are arranged at the inner side of a narrow side 44 and which are provided with wedge-shaped cut-outs 54 at sides confronting one another. Complementary free ends of a strip section of the outer portion 24 which serve as coupling elements 30 of the coupling

10 member 14 and which are each chamfered in accordance with the shape of the cut-outs 54 fit into these cut-outs 54. The coupling member 14 can also only be removed and inserted perpendicular to the flat side 51a of the DVD box 42 in this embodiment.

15 The possibilities described above by way of Figs. 3 to 6 in order to fix the coupling member 14 in a carrier 42 formed for example as a DVD box represent preferred examples for a connection, which can generally be designed in any manner, between the storage apparatus in accordance with the invention and a carrier 42 for the fixing in place of a flat housing  
20 by means of the coupling member 14.

Figs. 7 and 8 each show an embodiment of the coupling member 14 in accordance with the invention which is releasably connected to a rail system. Two rails 60 are provided which extend in parallel and are  
25 arranged at a spacing corresponding to the width of the coupling member 14 and the flat housing 10 and which are formed by multiple folding of a carrier element 62 made, for example, of sheet metal. A plurality of carrier elements 62 can be connected to one another by connecting elements 64

which can be screwed, for example, to a base carrier (not shown) of generally any kind in order to realize any rail length in this manner. Furthermore, an end piece 68 can be seen in Fig. 7 which can be coupled to an end face of a carrier element 62.

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A plurality of cut-outs 70, which extend transversely to the direction of the rails, are formed at regular intervals in the rails 60, whereby intermediate webs 72 are created at which holding lugs 74, which each project into one of the cut-outs 70, are formed.

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The coupling member 14 of the storage apparatus in accordance with the invention is provided at its outer portion 24 with roll or roller-like coupling elements 30 whose diameters are dimensioned such that the coupling elements 30 are latched in the cut-outs 70 by an elastic deformation of

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the holding lugs 74 and which can rotate in the cut-outs 70 rounded at 71. As a result, the coupling member 14 – in the state latched to the rail system – can be pivoted within an angular range which depends in particular on the design of the intermediate webs 72 and the material thickness of the outer portion 24.

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Fig. 8 shows a latched coupling element 30 of the coupling member 14 inserted into a cut-out 70 in an enlarged representation, with each intermediate web 72 having in the embodiment of the rail system shown two holding lugs 74 which each hold one coupling element 30 firmly in an interlocking manner and which are not in the way during the pivoting of the coupling member 14 as a result of apertures 73 provided in the outer portion 24. The coupling member 14 in the embodiment in accordance with Fig. 8 can be pivoted in each case relative to the longitudinal extent

of the rails 60 through an angle  $\alpha$  of approximately  $40^\circ$  to both sides of a vertical indicated by the broken line.

Abutment tongues 76, which are formed on the inner side of the coupling elements 30, abut the rails 60 in the latched state and provide a defined position of the coupling member 14 in the transverse direction with respect to the rails 60.

The coupling member 14 can generally be formed in any manner and in particular in accordance with the embodiments described above with respect to the connection of the coupling member 14 to a carrier. The coupling member 14 can thus generally be releasably connected to carriers of any design or formed as an integral component of the respective carrier.